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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,486	05/04/2006	Bipin S. Parekh	31941033013	2074

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HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

EXAMINER	
GREENE, JASON M	

ART UNIT	PAPER NUMBER
1797	

MAIL DATE	DELIVERY MODE
03/03/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,486	PAREKH ET AL.	
	Examiner	Art Unit	
	Jason M. Greene	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-18,24,44-50 and 52-90* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-18,24,44-50 and 52-90* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/25/09; 10/20/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Response to Arguments

1. Applicant's arguments with respect to claims 1-4, 6-18, 24, 44-50 and 52-67 have been considered but are moot in view of the new ground(s) of rejection.

Claims

2. The Examiner suggests Applicants delete the trademark Nafion® from claims 63 and 67 to clarify the claim language as trademarks represent the source of goods, not the goods themselves.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-4 and 6-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over McElroy et al. (US 5,348,691) in view of International Patent Application Publication WO 00/44479 and Kashkoush et al. (US 6,842,998 B2).

McElroy et al. discloses a gas mixture supply system capably of supplying a purge gas comprising a gas source capable of serving as a purge gas, a water source (32,34) and a purge gas generator (29) comprising a moisturizer (10) configured to add moisture to a purge gas, wherein the moisturizer comprises a first region containing a purge gas flow and a second region containing water wherein the first and second regions are separated by a membrane contactor, wherein the membrane contactor comprises a NAFION® membrane (see col. 2, lines 42-55) that is gas permeable and substantially resistant to liquid intrusion in Figs. 1-3 and col. 2, line 34 to col. 5, line 35.

McElroy et al. teaches the purge gas mixture comprising at least one purge gas and moisture, but does not teach the membrane contactor forming a hollow fiber wherein one of the first and second regions is within the fiber and the other of the first and second regions is outside the fiber.

WO 00/44479 teaches a similar gas supply system comprising a membrane contactor comprising a bundle of a plurality of gas permeable hollow fiber membranes having a first end and a second end, the membranes having an outer surface and an inner surface, the inner surface comprising a lumen (3) comprising one of the first and second regions, each end of the bundle potted with a liquid tight perfluorinated thermoplastic seal forming a unitary end structure with a perfluorinated thermoplastic housing (see page 22, line 25 to page 23, line 4) wherein the fiber ends are open to fluid

flow, the housing having an inner wall and an outer wall, wherein the inner wall defines a fluid flow volume and defines the other of the first and second regions between the inner wall and the hollow fiber membrane, the housing having a purge gas inlet connected to gas source and a purge gas mixture outlet, and the housing having a water inlet connected to a water source and a water outlet, wherein either the purge gas inlet is connected to the first end of the bundle and the purge gas mixture outlet is connected to the second end of the bundle or the water inlet is connected to the first end of the bundle and the purge gas outlet is connected to the second end of the bundle, wherein the hollow fiber membrane outer diameter is between 350 and 1450 microns (see page 3, lines 26-29), wherein the hollow fiber membranes have a porous skinned inner surface, a porous outer surface and a porous support surface between, or a skinned porous outer surface, a porous inner surface and a porous support structure between, wherein the purge gas mixture generator is capable of being heated for a sufficient length of time at a temperature sufficient to substantially remove compounds that volatilize at a temperature of 100 ^{0}C or less in Fig. 1 and page 2, line 4 to page 26, line 15.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the membrane contactor of WO 00/44479 into the system of McElroy et al. to provide a contactor having a very large membrane area per unit volume to allow for a compact assembly, as taught by WO 00/44479 in page 2, line 4 to page 4, line 2.

Kashkoush et al. explicitly teaches using a hollow fiber (11) membrane contactor (10) to add a liquid to a gas stream using a liquid impermeable (hydrophobic) polymer, wherein a mass flow controller (90) and a pressure regulator (100) are used to control the flow of gas and liquid, respectively, through the contactor in Figs. 1-3 and col. 3, line 14 to col. 5, line 11.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the mass flow controller and regulator of Kashkoush et al. into the system of McElroy et al. and WO 00/44479 in that such is a known control system for regulating the flow rates of liquid and gas through a contactor. Kashkoush et al. teaches that it is explicitly known in the art to use hollow fiber contactors to add liquid to a gas flow.

With regard to claim 8, McElroy et al. teaches providing the water at an elevated temperature to improve humidification rates in col. 4, lines 34-44, but does not explicitly mention a heating device. However, one of ordinary skill in the art at the time the invention was made would have recognized that a heating device could be utilized to heat the water to allow a smaller contactor to be used, as taught by McElroy et al. at col. 4, lines 34-44.

With regard to claims 9-11, while McElroy et al. does not explicitly teach the gas source comprising a purifier device, one of ordinary skill in the art would have recognized that a particle filter could (and almost certainly) would be utilized in the

purge gas source since such is well known in the art of airplane cabin filtration, which the disclosure of McElroy et al. is most concerned with (see col. 1). Also, the particle filter is inherently regenerable (such as by conventional backflushing). With regard to claim 11, a plurality if particle filters could be used in that duplicating parts for a multiplied effect is merely a choice of design.

With regard to claim 14, WO 00/44479 does not explicitly teach the porous skinned surface having pores 0.001-0.005 μm in diameter, but one of ordinary skill in the art at the time the invention was made would have recognized that the pore diameter could be selected as a matter of design choice.

With regard to claim 16, WO 00/44479 does not explicitly teach the supply system being capable of operation at a purge gas flow rate of at least about 30 l/m, but one of ordinary skill in the art would have recognized that the number and/or length of hollow fibers could be selected as a matter of design choice to allow for operation at any purge gas flow rate.

5. Claims 18, 24 and 68-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koizumi et al. (US 4,704,348) in view of McElroy et al. (US 5,348,691), International Patent Application Publication WO 00/44479 and Kashkoush et al. (US 6,842,998 B2).

Koizumi et al. discloses a method of humidifying a purge gas comprising passing the purge gas through a moisturizer (16) for a period sufficient to humidify the purge gas in Fig. 2 and col. 2, line 55 to col. 5, line 29.

Koizumi et al. does not teach the moisturizer comprising a first region comprising a purge gas flow and a second region containing water, wherein the first and second regions are separated by a gas-permeable membrane that is substantially resistant to liquid intrusion. However, as noted about McElroy et al. teaches a moisturizer having such a configuration in Figs. 1-3 and col. 2, line 34 to col. 5, line 35.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the membrane moisturizer of McElroy et al. into the method of Koizumi et al. since membrane moisturizers are known to have several advantages over other types of humidifiers, as noted by McElroy et al. at col. 1, lines 27-41. One of ordinary skill in the arts of either humidification or lithography would have recognized that excluding bacteria, minerals and/or liquid droplets from the purge gas would be advantageous.

Koizumi et al. and McElroy et al. do not teach the humidifier being a hollow fiber membrane contactor having the recited structure, but as noted above, WO 00/44479 teaches a hollow fiber membrane fluid-fluid contactor having such a structure in Fig. 1 and page 2, line 4 to page 26, line 15.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the membrane contactor of WO 00/44479 into the method of Koizumi et al. and McElroy et al. to provide a contactor having a very large

membrane area per unit volume to allow for a compact assembly, as taught by WO 00/44479 in page 2, line 4 to page 4, line 2.

Kashkoush et al. explicitly teaches using a hollow fiber (11) membrane contactor (10) to add a liquid to a gas stream using a liquid impermeable (hydrophobic) polymer, wherein a mass flow controller (90) and a pressure regulator (100) are used to control the flow of gas and liquid, respectively, through the contactor in Figs. 1-3 and col. 3, line 14 to col. 5, line 11.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the mass flow controller and regulator of Kashkoush et al. into the system of McElroy et al. and WO 00/44479 in that such is a known control system for regulating the flow rates of liquid and gas through a contactor. Kashkoush et al. teaches that it is explicitly known in the art to use hollow fiber contactors to add liquid to a gas flow.

With regard to claim 72, McElroy et al. teaches providing the water at an elevated temperature to improve humidification rates in col. 4, lines 34-44, but does not explicitly mention a heating device. However, one of ordinary skill in the art at the time the invention was made would have recognized that a heating device could be utilized to heat the water to allow a smaller contactor to be used, as taught by McElroy et al. at col. 4, lines 34-44.

With regard to claims 73-76, Koizumi et al. teaches the purge gas source comprising a purifier device (an inherently regenerable pre-filter) in Fig. 2 and col. 3, lines 13-16. With regard to claim 75, a plurality if particle filters could be used in that duplicating parts for a multiplied effect is merely a choice of design.

With regard to claim 79, WO 00/44479 does not explicitly teach the porous skinned surface having pores 0.001-0.005 μm in diameter, but one of ordinary skill in the art at the time the invention was made would have recognized that the pore diameter could be selected as a matter of design choice.

With regard to claims 83 and 84, WO 00/44479 does not explicitly teach the supply system being capable of operation at a purge gas flow rate of at least about 30 l/m, but one of ordinary skill in the art would have recognized that the number and/or length of hollow fibers could be selected as a matter of design choice to allow for operation at any purge gas flow rate.

6. Claims 44-50 and 52-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koizumi et al. (US 4,704,348) in view of McElroy et al. (US 5,348,691), International Patent Application Publication WO 00/44479 and Kashkoush et al. (US 6,842,998 B2).

Koizumi et al. discloses a lithographic projection apparatus and a method for providing purge gas to at least part of the lithographic apparatus comprising an

illuminator (41) configured to provide a projection beam of radiation, a support structure configured to support a pa patterning device (6), the patterning device configured to pattern the projection beam according to a desired pattern, a substrate table (1) configured to hold a substrate (3), a projection system (5) configured to project the patterned beam onto a target portion of the substrate, and at least one purge gas supply system (10) configured to provide a purge gas to at least part of the lithographic projection apparatus comprising a purge gas mixture generator comprising a moisturizer (16) configured to add moisture to a purge gas, the purge gas mixture generator configured to generate a purge gas mixture comprising at least one purge gas and the moisture, and a purge gas mixture outlet connected to the purge gas mixture generator configured to supply the purge gas mixture to the at least part of the lithographic apparatus in Figs. 2 and 7 and col. 2, line 55 to col. 5, line 29.

Koizumi et al. does not teach the moisturizer comprising a first region comprising a purge gas flow and a second region containing water, wherein the first and second regions are separated by a gas-permeable membrane that is substantially resistant to liquid intrusion. However, as noted about McElroy et al. teaches a moisturizer having such a configuration in Figs. 1-3 and col. 2, line 34 to col. 5, line 35.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the membrane moisturizer of McElroy et al. into the system of Koizumi et al. since membrane moisturizers are known to have several advantages over other types of humidifiers, as noted by McElroy et al. at col. 1, lines 27-41. One of ordinary skill in the arts of either humidification or lithography would have

recognized that excluding bacteria, minerals and/or liquid droplets from the purge gas would be advantageous.

Koizumi et al. and McElroy et al. do not teach the humidifier being a hollow fiber membrane contactor having the recited structure, but as noted above, WO 00/44479 teaches a hollow fiber membrane fluid-fluid contactor having such a structure in Fig. 1 and page 2, line 4 to page 26, line 15.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the membrane contactor of WO 00/44479 into the method of Koizumi et al. and McElroy et al. to provide a contactor having a very large membrane area per unit volume to allow for a compact assembly, as taught by WO 00/44479 in page 2, line 4 to page 4, line 2.

Kashkoush et al. explicitly teaches using a hollow fiber (11) membrane contactor (10) to add a liquid to a gas stream using a liquid impermeable (hydrophobic) polymer, wherein a mass flow controller (90) and a pressure regulator (100) are used to control the flow of gas and liquid, respectively, through the contactor in Figs. 1-3 and col. 3, line 14 to col. 5, line 11.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the mass flow controller and regulator of Kashkoush et al. into the system of McElroy et al. and WO 00/44479 in that such is a known control system for regulating the flow rates of liquid and gas through a contactor. Kashkoush et al. teaches that it is explicitly known in the art to use hollow fiber contactors to add liquid to a gas flow.

With regard to claim 53, McElroy et al. teaches providing the water at an elevated temperature to improve humidification rates in col. 4, lines 34-44, but does not explicitly mention a heating device. However, one of ordinary skill in the art at the time the invention was made would have recognized that a heating device could be utilized to heat the water to allow a smaller contactor to be used, as taught by McElroy et al. at col. 4, lines 34-44.

With regard to claims 54-56, Koizumi et al. teaches the purge gas source comprising a purifier device (an inherently regenerable pre-filter) in Fig. 2 and col. 3, lines 13-16. With regard to claim 56, a plurality if particle filters could be used in that duplicating parts for a multiplied effect is merely a choice of design.

With regard to claim 59, WO 00/44479 does not explicitly teach the porous skinned surface having pores 0.001-0.005 μm in diameter, but one of ordinary skill in the art at the time the invention was made would have recognized that the pore diameter could be selected as a matter of design choice.

With regard to claim 61, WO 00/44479 does not explicitly teach the supply system being capable of operation at a purge gas flow rate of at least about 30 l/m, but one of ordinary skill in the art would have recognized that the number and/or length of

hollow fibers could be selected as a matter of design choice to allow for operation at any purge gas flow rate.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (571) 272-1157. The examiner can normally be reached on Monday - Friday (10:00 AM to 6:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Marcheschi can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason M. Greene/
Primary Examiner, Art Unit 1797

jmg
February 27, 2010